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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/161,520	09/29/98	SATO	J SON-1450/DIV

IM22/1130

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EXAMINER

POWELL, A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED:

*16*  
11/30/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**09/161,520**

Applicant(s)  
**Sato**

Examiner  
**Powell, A.**

Group Art Unit  
**1763**



☒ Responsive to communication(s) filed on 9/27/00

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 12-14 and 16-27 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 12-14, 16-23, 25, and 27 is/are rejected.

☒ Claim(s) 24 and 26 is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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11/14/00

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

2. Claim 12 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al.

Wang et al disclose a method of polishing or planarizing the surface of a work piece (col. 1, lines 9-13) by chemical mechanical polishing (CMP) means by applying an aqueous slurry comprising water, submicron solid particles such as boehmite and a basic oxidizing agent, such as a peroxide (col. 3, lines 20-24 and 46-53; claim 3) Wang et al disclose particles that are more abrasive than silica (col.2, lines 23-31; col. 4, lines 26-31).

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 13-14, 22-24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al in view of Pearson.

Wang et al do not disclose expressly the formation of boehmite.

Pearson discloses a method of making a microcrystalline boehmite product mixing an alumina seed material with water and a less expensive alumina product to form an aqueous slurry that is hydrothermally digested (Fig. 5; col. 3, lines 10-22; col. 4, lines 54-55). An aluminum product suggests sodium aluminate, as this is a well known aluminum product.

It would have been obvious to a person of ordinary skill on the art to combine the method of making a boehmite product of Pearson with the CMP method of Wang et al.

The motivation for doing so would have been to provide boehmite particles as abrasives for a CMP slurry.

Therefore, it would have been obvious to combine Wang et al with Pearson to obtain the invention as specified in claims 13-14, 22-24 and 27.

5. Claims 16-20 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Pearson as applied to claims 13-14, 22-24 and 27 above, and further in view of Krussell et al.

Wang et al and Pearson et al disclose an aqueous slurry having submicron boehmite particles formed from alumina seed material.

Wang et al and Pearson do not disclose expressly a wafer cleaning by a  $\text{NH}_4\text{OH}$ -  $\text{H}_2\text{O}_2$  -  $\text{H}_2\text{O}$  solution followed by a hydrofluoric acid solution and rinse in pure water.

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Krusell et al disclose prior art with steps for wafer cleaning with a  $\text{NH}_4\text{OH}-\text{H}_2\text{O}_2-\text{H}_2\text{O}$  solution followed by a hydrofluoric acid solution and rinse in pure water (col. 1, lines 9-12 and 45-64).

It would have been obvious to combine wafer cleaning of Krusell et al with the CMP method of Wang et al and Pearson

The motivation for doing so would have been to remove residual contaminants from the wafer as taught by Krusell. (Col. 1, lines 45-64).

Therefore, it would have been obvious to combine Wang et al with Pearson and Krusell to obtain the invention as specified in claims 16-20 and 25.

### ***Claim Objections***

Claims 24 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

6. As to the arguments concerning a slurry having an abrasive in a basic atmosphere (pg. 6), Wang et al disclose basic oxidizing agents used in polishing compositions (claim 3). Therefore, Wang et al disclose both an acidic and basic atmosphere. Therefore, the applicants basic atmosphere does not distinguish over the prior art.

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7. As to arguments concerning Brancaleoni et al (U.S. Pat. No. 5,391,258) (Pgs. 7-8), which is incorporated within the Wang reference (col. 3, lines 55-57), Brancaleoni et al disclose an acidic slurry formed with phthalate compounds. However, Wang et al disclose both an acidic and basic atmosphere. Wang et al disclose basic oxidizing agents used in polishing compositions (claim 3).

8. As to arguments concerning a slurry consisting essentially of boehmite (pg. 9), Wang et al disclose boehmite (alpha-aluminum compounds) in a slurry (col. 3, lines 63-68; col. 4, lines 1-10 and 30). The additional abrasive particles within the slurry do not materially change the characteristic of applicants' invention.

9. As to arguments concerning the formation of aluminum compounds (pg. 9), Wang discloses the formation of aluminum compounds by flame synthesis.

10. The Examiner agrees with the 102 arguments concerning the formation of boehmite (pg. 6). Pearson is now applied to claims 22 and 27.

11. As to the arguments concerning the combining of Wang and Pearson for the 103 rejection (pg. 9), Wang discloses a process for forming aluminum compounds. Pearson is used for the formation of boehmite, an aluminum compound. The aluminum compounds can be used in a variety of products (e.g., basic aqueous medium - claim 1). Therefore, the use of Pearson in combination with Wang is proper.

12. As to the arguments concerning the combining of Wang, Pearson, and Krussell for the 103 rejection (pg. 9), the rinsing of a substrate after polishing is standard. Krussell is used for the

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teaching of rinsing a substrate. Therefore, combining Wang et al with Pearson and Krussell et al is proper.

13. As to arguments concerning the dipping of aluminum in hot water (pg. 9), Pearson discloses the addition of sodium aluminate to a dilute solution at 50°C.

***Conclusion***

14. Any inquiry concerning this communication or earlier communication should be directed to Alva C. Powell at telephone number (703) 305-0541.

The fax phone number for this Group is (703) 872-9310 for an official fax.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

  
Alva C. Powell

11/16/00

  
**GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
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